lowuan ellis

claims pto

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1. (Currently Amended) A display apparatus that includes a display body displaying a picture, a stand supporting the display body, and a hinge assembly, the hinge assembly comprising:

a tilting hinge, provided between the display body and the stand to tilt the display body relative to the stand;

a pivoting hinge, provided between the display body and the tilting hinge to pivot the display body relative to the stand, wherein the pivoting hinge comprises:

a pivoting bracket, engaged to the display body, and

a pivoting support bracket, that rotationally engages the pivoting bracket, and engages the tilting hinge;

a swiveling hinge, provided between the tilting hinge and the stand to swivel the display body relative to the stand; and

a body bracket detachably engaged to a rear of the display body, and engaged with the pivoting bracket, wherein:

the pivoting hinge further comprises a pivoting shaft, that projects from the pivoting bracket toward the pivoting support bracket;

the pivoting support bracket comprises a pivoting shaft accommodating part, into which the pivoting shaft is inserted;

the pivoting hinge further comprises a first snap ring engaged to an end part of the pivoting shaft; and

the end part of the pivoting shaft comprises a taper part, wherein the first snap ring engages the pivoting shaft at the taper part, and the first snap ring bears on the pivoting support bracket and forces the pivoting support bracket toward the pivoting bracket with a force that is

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proportional to a taper of the taper part.

2. (Original) The display apparatus according to claim 1, wherein the pivoting hinge comprises:

a pivoting bracket, engaged to the display body; and

a pivoting support bracket, that rotationally engages the pivoting bracket, and engages the tilting hinge.

3. (Previously Presented)The display apparatus according to claim 1, wherein:

at least one of the pivoting bracket and the pivoting support bracket is made of brass.

4. (Previously Presented) The display apparatus according to claim 1, wherein:

at least one of the pivoting bracket and the pivoting support bracket is made of plastic.

5. (Original) The display apparatus according to claim 2, wherein:

the pivoting hinge further comprises a pivoting shaft, that projects from the pivoting bracket toward the pivoting support bracket; and

6. (Original) The display apparatus according to claim 5, wherein:

the pivoting hinge further comprises a first snap ring engaged to an end part of the pivoting shaft; and

the end part of the pivoting shaft comprises a taper part, wherein the first snap ring engages the pivoting shaft at the taper part, and the first snap ring bears on the pivoting support bracket and forces the pivoting support bracket toward the pivoting bracket with a force that is proportional to a taper of the taper part.

7. (Previously Presented) The display apparatus according to claim 1, wherein the pivoting hinge further comprises:

a ball flange located eccentrically from a pivoting axis of the pivoting support bracket; and

the pivoting bracket comprises a ball guide part, in the shape of circular arc having a predetermined angle, recessed from a surface of the pivoting bracket,

wherein the location of the ball guide part corresponds to the ball flange.

8. (Previously Presented) A display apparatus that includes a display body displaying a picture, a stand supporting the display body, and a hinge assembly, the hinge assembly comprising;

a tilting hinge, provided between the display body and the stand to tilt the display body relative to the stand;

a pivoting hinge, provided between the display body and the tilting hinge to pivot the display body relative to the stand; and

a swiveling hinge, provided between the tilting hinge and the stand to swivel the display body relative to the stand, wherein the pivoting hinge further comprises:

a pivoting bracket, engaged to the display body;

a pivoting support bracket, that rotationally engages the pivoting bracket, and engages the tilting hinge, and

a ball flange located eccentrically from a pivoting access of the pivoting support bracket, wherein:

the pivoting bracket comprises a ball guide part, in the shape of circular arc having a predetermined angle, recessed from a surface of the pivoting bracket, and

the location of the ball guide part corresponds to the ball flange, wherein the ball flange comprises:

a ball that is guided by the ball guide part; and

a coil spring that engages the ball and pushes the ball toward the ball guide part by exerting an elastic force.

9. (Original) The display apparatus according to claim 8, wherein:

the pivoting support bracket further comprises a ball flange screw hole that is internally threaded; and

the ball flange further comprises an adjusting screw, disposed in the ball flange screw hole, that engages the coil spring,

wherein rotating the adjusting screw adjusts the elastic force that the coil spring exerts on the ball.

10. (Original) The display apparatus according to claim 9, wherein:

adjusting the elastic force that the coil spring exerts on the ball adjusts a first friction force between the ball and the ball guide.

11. (Original) The display apparatus according to claim 10, wherein the ball guide part further comprises:

two ends, each end comprising a rotation restraining part recessed farther from the surface of the pivoting bracket than the ball guide part,

wherein when the ball is located in the rotation restraining part, the display maintains a pivot angle.

12. (Original) The display apparatus according to claim 11, wherein:

a first force is required to overcome the first friction force and change the pivot angle of the display when the ball is not located in the rotation restraining part;

a second force, of greater magnitude than the first force, is required to overcome the first friction force and change the pivot angle of the display when the ball is located in the rotation

restraining part.

13. (Original) The display apparatus according to claim 7, wherein:
the predetermined angle of the circular arc is approximately 90°.

14. (Original) The display apparatus according to claim 7, wherein:
the predetermined angle of the circular arc is approximately 180°.

15. (Original) The display apparatus according to claim 7, wherein:
the predetermined angle of the circular arc is greater than approximately 180°.

16. (Original) The display apparatus according to claim 2, further comprising:
a body bracket detachably engaged to a rear of the display body, and engaged with the pivoting bracket.

17. (Previously Presented) The display apparatus according to claim 1, wherein:

the display body comprises first screw holes;

the body bracket comprises second screw holes; and

the first and second screw holes are formed in accordance with a Video Electronics Standard Association Flat Display Mounting Interface (VESA FDMI) standard.

18. (Previously Presented) A display apparatus, that includes a display body displaying a picture, a stand supporting the display body, and a hinge assembly, the hinge assembly comprising:

a tilting hinge, provided between the display body and the stand to tilt the display body relative to the stand;

a pivoting hinge, provided between the display body and the tilting hinge to pivot the display body relative to the stand; and

a swiveling hinge, provided between the tilting hinge and the stand to swivel the display body relative to the stand,

wherein the swiveling hinge comprises:

a swiveling support bracket, engaged to the stand;

a swiveling bracket having

a lower part swivelably engaged with the swiveling support bracket, and

an upper part engaged with the tilting hinge;

a swiveling shaft that projects from the swiveling support bracket towards the swiveling bracket, wherein the swiveling bracket comprises a swiveling shaft accommodating part into which the swiveling shaft is inserted; and

a second snap ring engaged to an end part of the swiveling shaft,

wherein the end part of the swiveling shaft comprises a taper part, wherein the second snap ring engages the swiveling shaft at the taper part, and the second snap ring bears on the swiveling bracket and forces the swiveling bracket toward the swiveling support bracket with a force that is proportional to a taper of the taper part.

19. (Original) The display apparatus according to claim 18, wherein:

at least one of the swiveling bracket and the swiveling support bracket is made of brass.

20. (Original) The display apparatus according to claim 18, wherein:

at least one of the swiveling bracket and the swiveling support bracket is made of plastic.

21. (Previously Presented) The display apparatus according to claim 1, wherein the swiveling hinge comprises:

a swiveling support bracket, engaged to the stand; and

a swiveling bracket having

a lower part swivelably engaged with the swiveling support bracket, and

an upper part engaged with the tilting hinge.

22. (Original) The display apparatus according to claim 18, wherein:

the swiveling hinge further comprises: a swiveling shaft that projects from the swiveling support bracket toward the swiveling bracket; and

the swiveling bracket comprises a swiveling shaft accommodating part into which the swiveling shaft is inserted.

23. (Original) The display apparatus according to claim 22, wherein:

the swiveling hinge further comprises: a second snap ring engaged to an end part of the swiveling shaft; and

the end part of the swiveling shaft comprises a taper part, wherein the second snap ring engages the swiveling shaft at the taper part, and the second snap ring bears on the swiveling bracket and forces the swiveling bracket toward the swiveling support bracket with a force that is proportional to a taper of the taper part.

24. (Original) The display apparatus according to claim 1, wherein the swiveling hinge comprises:

a swiveling shaft, engaged to the tilting hinge;

a bearing having an inner side engaged to the swiveling shaft; and

a swiveling support bracket, having

an upper part engaged with an outer side of the bearing, and

a lower part engaged with the stand.

25. (Original) The display apparatus according to claim 24, wherein the swiveling hinge further comprises:

a friction member having

a first side engaged to the tilting hinge, and

a second side contacting the swiveling support bracket.

26. (Original) The display apparatus according to claim 25, wherein:

the friction member is made of felt.

27. (Original) The display apparatus according to claim 25, wherein:

the friction member is made of plastic.

28. (Original) The display apparatus according to claim 25, further comprising:

a swiveling bracket having

an upper part engaged to the tilting hinge, and

a lower part engaged to the swiveling shaft,

wherein the swiveling bracket engages the first side of the friction member.

29. (Original) The display apparatus according to claim 1, wherein the tilting hinge

comprises:

a tilting support bracket, having a lower part engaged to the swiveling hinge; and

a tilting bracket, engaged with the pivoting hinge and rotationally engaged to the tilting support bracket.

30. (Original) The display apparatus according to claim 29, wherein the tilting bracket comprises:

a first snap ring accommodating part to accommodate the pivoting shaft and the first snap ring.

31. (Original) The display apparatus according to claim 29, wherein the tilting support bracket comprises:

a second snap ring accommodating part to accommodate the swiveling shaft and the second snap ring.

32. (Previously Presented) The display apparatus according to claim 29, wherein:

the tilting support bracket has two ends, each comprising a bolt accommodating part,

wherein when the tilting bracket engages the tilting support bracket, the bolt accommodating parts align and a screw bolt passes through the bolt accommodating parts to secure the tilting bracket and the tilting support bracket together, and rotate the display around the screw bolt, thereby tilting the display relative to the stand.

33. (Original) The display apparatus according to claim 32, wherein the tilting hinge further comprises:

a screw nut that engages the screw bolt to secure the screw bolt in the bolt accommodation parts.

34. (Previously Presented) The display apparatus according to claim 33, wherein:

rotating the screw nut about the screw bolt adjusts a friction force between the tilting bracket and the tilting support bracket.

35. (Original) The display apparatus according to claim 32, wherein:

one end of the tilting bracket further comprises a pair of stoppers,

each stopper having a face, and

a predetermined angle is formed between the faces; and

one end of the tilting support bracket further comprises a tilting projection that is accommodated between the faces, and engages the faces to limit a tilt angle of the display.

36. (Original) The display apparatus according to claim 35, wherein:

a range of the tilt angle of the display is adjusted by adjusting a size of the tilting projection.

37. (Original) The display apparatus according to claim 35, wherein:

a range of the tilt angle of the display is adjusted by adjusting the predetermined angle formed between the faces.

38. (Original) The display apparatus according to claim 32, wherein:

one end of the tilting support bracket further comprises a pair of stoppers,

each stopper having a face, and

a predetermined angle is formed between the two faces; and

one end of the tilting bracket further comprises a tilting projection that is accommodated between the faces, and engages the faces to limit a tilt angle of the display.

39. (Currently Amended) A display apparatus that includes a display body displaying a picture, and a stand supporting the display body, comprising:

a hinge assembly located between the display body and the stand, that rotates the display body about first, second, and third axes,

wherein each axis is perpendicular to at least one other axis, and

the hinge assembly further comprises:

a pivoting hinge that rotates the display body about the first axis, the first axis being perpendicular to the display ~~body;~~ wherein the pivoting hinge comprises:

a pivoting bracket, engaged to the display body, and

a pivoting support bracket, that rotationally engages the pivoting bracket, and engages the tilting hinge;

a swiveling hinge that rotates the display body about the second axis, the second axis being perpendicular to the stand;

a tilting hinge that rotates the display body about the third axis, the third axis being perpendicular to the first and second axes; and

40. (Original) The display apparatus according to claim 39, wherein the hinge assembly further comprises:

a pivoting hinge that rotates the display body about the first axis, the first axis being perpendicular to the display body;

a swiveling hinge that rotates the display body about the second axis, the second axis being perpendicular to the stand; and

a tilting hinge that rotates the display body about the third axis, the third axis being perpendicular to the first and second axes.

41. (Currently Amended) A display apparatus that includes a display body displaying a picture, and a stand supporting the display body, comprising:

a hinge assembly having

a tilting hinge, provided between the display body and the stand to tilt the display body relative to the stand,

a pivoting hinge, provided between the display body and the tilting hinge to pivot the display body relative to the stand, wherein the pivoting hinge comprises:

a pivoting bracket, engaged to the display body, and

a pivoting support bracket, that rotationally engages the pivoting bracket, and engages the tilting hinge;

a swiveling hinge, provided between the tilting hinge and the stand to swivel the display body relative to the stand; and

a body bracket that

has first screw holes,

is detachably engaged to the display body, and

is engaged to the pivoting hinge,

wherein the display body has second screw holes that correspond to the first screw holes, and the first and second screw holes are arrayed in accordance with a Video Electronics Standard Association Flat Display Mounting Interface (VESA FDMI) standard,

wherein:

the pivoting hinge further comprises a pivoting shaft, that projects from the pivoting bracket toward the pivoting support bracket;

the pivoting support bracket comprises a pivoting shaft accommodating part, into which the pivoting shaft is inserted;

the pivoting hinge further comprises a first snap ring engaged to an end part of the pivoting shaft; and

the end part of the pivoting shaft comprises a taper part, wherein the first snap ring engages the pivoting shaft at the taper part, and the first snap ring bears on the pivoting support bracket and forces the pivoting support bracket toward the pivoting bracket with a force that is proportional to a taper of the taper part.